

**5th SEMESTER
GENERIC ELECTIVE**

MM516G: MATHEMATICS - I

6 CREDITS

Unit –I

Cartesian Product of Sets, Relations, Types of relations, Functions, Types of functions, Composition of functions, Inverse of a function , Limit of a function, Left hand and right hand limits, Properties and evaluation of limits, Continuity of a function, Tests of continuity, Types of discontinuities.

Unit –II

Differentiation of a function, Rules of differentiation, Differentiation of $x^n, (ax+b)^n$, trigonometric and inverse trigonometric functions, exponential, logarithmic, hyperbolic and inverse hyperbolic functions, Successive differentiation, Leibnitz's Theorem, Partial Differentiation, Total differentiations, Euler's Theorem.

Unit –III

Integration as inverse process of differentiation, Indefinite and definite integrals, Integration by substitution , by parts and by partial fractions methods, Integrals of the types $\sqrt{a^2-x^2}, \sqrt{a^2+x^2}$ and $\sqrt{x^2-a^2}$, trigonometric and inverse trigonometric functions, exponential, logarithmic, hyperbolic and inverse hyperbolic functions, Reduction Formulae.

Unit –III

Differential equations, Order and degree of a differential equation, Differential equations of the first order and their solutions by Variables Separable Method, Solutions of homogeneous and non-homogeneous differential equations of first order, Solution of the linear differential Equation $dy/dx + Py = Q$, Equations reducible to linear form, Change of variables method, Bernoulli's differential equation.

Books Recommended

1. S.D. Chopra, M.L.Kochar and A.Aziz, Differential Calculus, Kapoor Publications.
2. S.D. Chopra and M.L.Kochar, Integral Calculus, Kapoor Publications.